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i korišćenje zemljišta i deponija, Beograd
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ZEMLJIŠTE 2015
INTEGRISANI SKUP
II SAVETOVANJE
sa međunarodnim učešćem
PLANIRANJE I UPRAVLJANJE ZEMLJIŠTEM
U FUNKCIJI ODRŽIVOG RAZVOJA
I
V KONFERENCIJA
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Izdavač
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THE INFLUENCE OF A DOUGLAS-FIR MONOCULTURE ON DYNAMICS AND COMPOSITION OF HUMUS AT LOWER ALTITUDES ON MALJEN MT.

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ABSTRACT

Tree species composition is one of the most important factors determining the development of soil, especially humus formation in forests. This study investigates the effects of forty years of Douglas-fir (Pseudotsuga menziesii (Mirb.) Franco) cultivation on quantitative and qualitative humus dynamics and the intensity of organic matter decomposition. The Douglas-fir monoculture was established following the clear-cutting of the autochthonous beech forest (Fagetum moesiacae montanum, Maljen Mt, 850 m alt., north-west Serbia) in 20m-wide strips. The clear-cutting of the beech trees led to the intensification of the humus mineralization process, resulting in lower amounts of humus with an unfavorable chemical composition in the top soil layer (0-10 cm) in the Douglas-fir culture in relation to the control under the beech stand (17.52 ± 1.38 % : 10.08 ± 0.24 %; $p<0.001$). Qualitative changes of humus were reflected in lower pH values ($p<0.05$), lower amounts of humic acids (HAs)($p<0.001$), higher amounts of fulvic acids (FAs) ($p<0.01$), especially fulvic acid 1a ($p<0.001$), and higher humin content ($p<0.01$) in the top soil of the Douglas-fir culture. Displacement of Al was observed only in the soil of the culture (0-20cm soil layer). Although the ratio of humic and fulvic acids on both surfaces was less than 1, which is characteristic of dystric cambisol, their ratio was more favorable in the soil under the beech stand (0.76 : 0.57). The slower decomposition of organic Douglas-fir matter and its accumulation (12.79 ± 4.02 t : 7.48 ± 2.37 t: $p<0.001$) was also noted, which shows that the planting of Douglas-firs has contributed to the slowing of the metabolism of this ecosystem. The results obtained in this study suggest that prolonged Douglas-fir cultivation in beech habitat may lead to the further degradation and depletion of soil on which this culture was established.

Keywords: degraded habitat, Douglas-fir culture, beech, soil, humus